Transportation Synthesis Report

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Process Mapping for DOT Business Functions

Prepared for
Bureau of Business Services
Division of Business Management

Prepared by
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Transportation Synthesis Reports (TSRs) are brief summaries of currently available information on topics of interest to WisDOT staff. Online and print sources include NCHRP and other TRB programs, AASHTO, the research and practices of other state DOTs, and related research and news. Internet hyperlinks in TSRs are active at the time of publication, but changes on the host server can make them obsolete.

Request for Report

A process map is described as a marriage between a traditional process chart and a computer system flow chart.[1] A growing number of firms are successfully using process mapping as an aid to streamlining and re-engineering business processes and identifying ways to improve customer focus and satisfaction. The RD&T Section was asked to locate examples of the use of process mapping for business functions by other transportation agencies.

[1]Process Mapping – Leeds Metropolitan University- Learning and Information Services: Productivity Resources http://www.lmu.ac.uk/lis/imgtserv/tools/processmapping.htm.

Summary

We located a number of cases in which process maps, flow charts and diagrams are being used to map transportation business functions (**Section I: Process Mapping for Business Functions**). These cases include:

- Flow charts that visualize consultant contracting procedures (Washington State and Minnesota DOTs).
- Diagrams providing guidance for new product evaluation (Utah) and for printing, publishing and distribution (Virginia).
- Process maps illustrating roles, responsibilities and procedural networking involved in the project design process (Washington and Utah).

We also located a number of cases in which flow charts were used to map non-business functions that could serve as potential models for business process mapping (**Section II: Other Process Mapping Approaches for DOTs**). These examples include:

- A flow chart showing the procedure for processing non-competitive bid contracts (Michigan).
- A diagram illustrating the administrative process associated with camera enforcement (UK).
- A chart outlining the process flow for major highway projects (Minnesota).
- A process map for coordinating state, regional and local planning processes and integrating environmental considerations in land use and infrastructure planning (California).

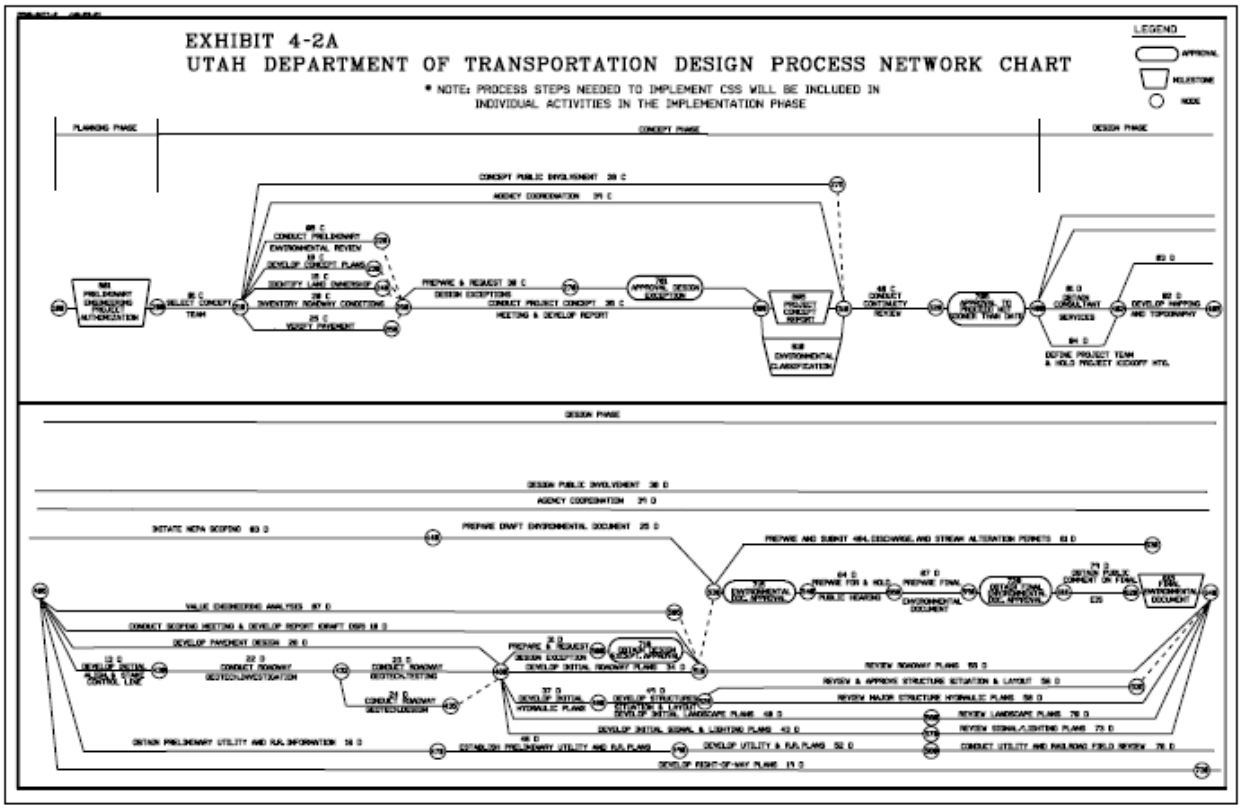
1. Process Mapping for Business Functions

Minnesota

Mn/DOT Office of Technical Support
Consultant Services Section (CSS)
Contract Process Flow Charts
http://www.dot.state.mn.us/consult/files/flowcharts/flcharts.html.
Five contracting processes are charted: direct select, interagency, joint powers, single source and T-contract. The invoicing process is also charted. The charts outline the distributed process followed by CSS to execute a professional technical service contract.
Related documents of interest:
- Professional/technical contract documents (http://www.dot.state.mn.us/consult/files/internal/document.html) – This section provides links to professional technical contract documents, samples of letters and any other documents that CSS utilizes.
- Internal training/reference documents (http://www.dot.state.mn.us/consult/files/training/training.html) – This section contains documents to assist Mn/DOT contract administrators and project managers in the professional technical contracting process.

Utah

UDOT Project Development Group- Project Management Information
Design Process Flowcharts
http://www.udot.utah.gov/index.php/m=c/tid=722.
These charts enable users of the UDOT Design Process Manual (http://www.dot.state.ut.us/download.php/tid=721/DesignProcessManual.pdf) to quickly recognize the sequence and connectivity of design activities discussed in the manual.
Chart 1 of 2:



Research Division- Development Section
New Products Evaluation Panel (NPEP) Process flow chart
http://www.udot.utah.gov/download.php/tid=238/NPEP.pdf.
NPEP (http://www.udot.utah.gov/index.php/m=c/tid=238) acts as a clearinghouse for the department, providing a valuable service to UDOT by processing vendor applications and distributing product information among interested parties.

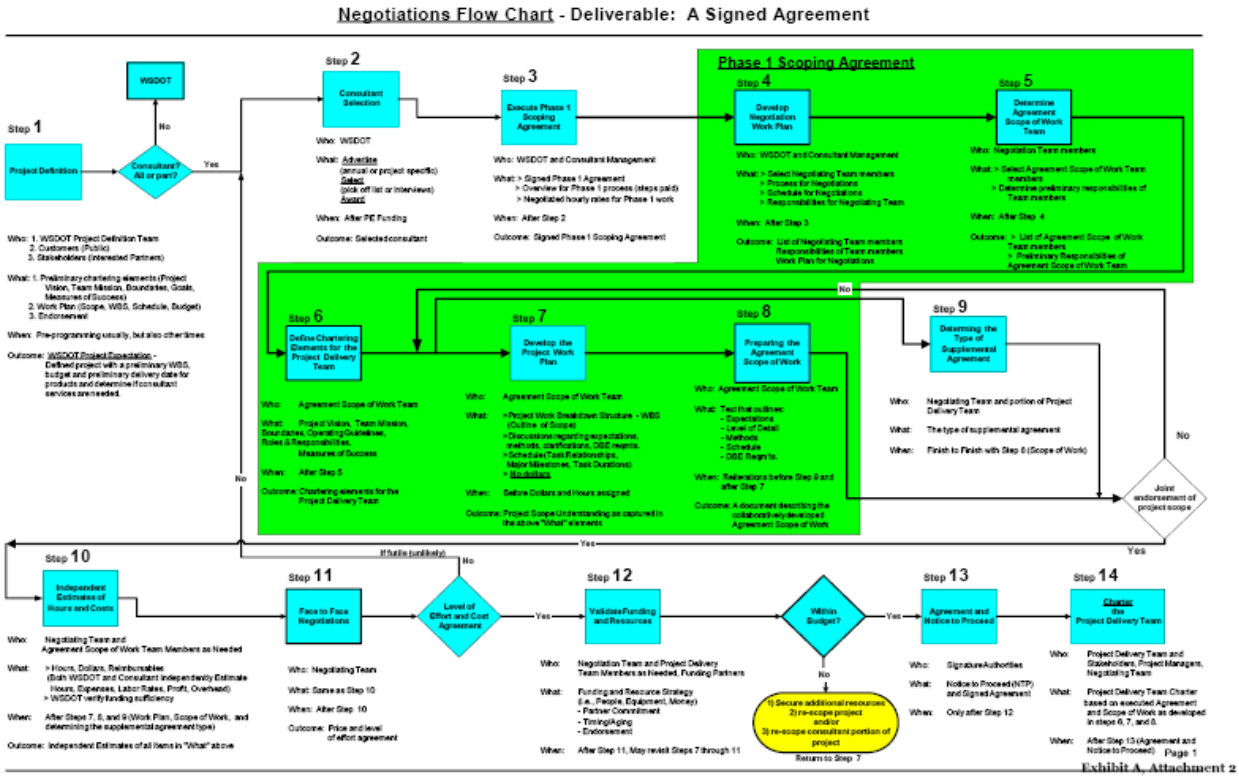
Virginia

VDOT Business: Construction
Internal Processes: Procedures Utilized for Schedule & Contract Division
Process Flow Chart for Publishing Road and Bridge Specifications Book & Construction Manual
http://www.virginiadot.org/business/const/resources/Process%20instruction%20for%20Specifications.pdf (scroll to pages 3 through 7).
Procedures of interest:

- Step 5 – Specifications and timeframes for publishing book or manual are reviewed, detailed and finalized with Administrative Services Division and Department of General Services that will advertise the publishing contract.
- Steps 6 and 7 – Department of General Services advertises the publishing proposal; the publishing contract is awarded.
- Step 10 – Publication is delivered to Fulton Warehouse with partial shipment sent to Scheduling and Division plan room for sale to contractors/suppliers/public. State Specifications Engineer and Scheduling and Contract Division Administrator decide on final price per unit for sale purposes. Bulk of shipment delivered, warehoused and inventoried by Administrative Services Division. Asst. State Specifications Engineer prepares CD Memorandum to accompany distribution and Addendum of specifications added since publication cut-off date.
- Step 11 – Asst. State Specifications Engineer works with Administrative Services to distribute books to various districts. Districts send name of contact. Shipments made to district warehouse facilities. Each district does its own internal distribution. Asst. State Specifications Engineer along with Specifications Section make distribution to Central Office and Elko Materials personnel. Copies retained in Scheduling and Contract plan room for sale. Sale price determined by State Specifications Engineer by dividing cost for publishing by number of copies received and rounding off to nearest half or full dollar.

Washington

WSDOT Consultant Services
Manuals/Forms: Scope of Work, Exhibit A, Attachment 2
Negotiations Flow Chart – Deliverable: A Signed Agreement
http://www.wsdot.wa.gov/consulting/Forms/ScopeofWorkAttachment2.pdf.



The narrative for the Negotiations Flow Chart may be viewed at http://www.wsdot.wa.gov/consulting/Forms/ScopeofWorkAttachment1.pdf. Further information regarding WSDOT Consultant Services is available at http://www.wsdot.wa.gov/consulting/default.htm.

WSDOT Design Manual: Chapter 141- Project Development Roles and Responsibilities for Projects with Structures
http://www.wsdot.wa.gov/EESC/Design/DesignManual/desEnglish/141-E.pdf.
This chapter presents the project development process used by WSDOT, the regions and the Bridge and Structures Office together to determine roles and responsibilities for projects with structures during the project development phase. The primary objective of this process is to provide a consistent means of selecting a bridge design team to perform all or part of the structural design work, be it a consultant or the Bridge and Structures Office. The flow diagram, Figures 141-1a and 141-1b, begins at the left with the initial approval and funding of the project and ends at the right with the start of the project delivery process.

WSDOT North Central Region Environmental Compliance Plan
http://www.wsdot.wa.gov/environment/compliance/docs/NCEnvCompPlan2005.pdf.
Although there has been an unwritten process used in the region in the past, developing a written procedure and specific contacts provides a clear and predictable process that will result in quick response to non-compliant activity, thus minimizing impacts. The flow chart in figure 1 illustrates the general process for construction non-compliant events in the North Central Region.

Canada

Transport Canada: Civil Aviation- Aircraft Certification
Design Approval Delegate Newsletter- Vol. 6, No. 1, March 2002
Business Process Mapping
http://www.tc.gc.ca/civilaviation/certification/delegations/newsletters/march02/mapping.htm (scroll down to flow chart).
Transport Canada is in the process of dealing with various designer/manufacturers on developing a flow chart diagram that lays out how an aeronautical product moves through the certification process from "program go" to issuance of a Transport Canada Type Certificate. The process started with Pratt & Whitney Canada and Transport Canada working together with a facilitator to outline how the certification process was presently working between the two entities and how ideally it should work. Some of the surprising things learned were that in some cases neither side understood who was responsible for what: either nobody was doing a particular task, or both sides were doing the same task.

Transport Canada: Civil Aviation- Regulatory Services
Canadian Aviation Regulatory Advisory Council (CARAC) Management Charter and Procedures (2003 Edition)
CARAC Process Work Flow
http://www.tc.gc.ca/civilaviation/RegServ/Affairs/carac/Charter/DIV3_App5.htm (scroll down to chart).
CARAC is a joint undertaking of government and the aviation community, with participation from a large number of organizations outside Transport Canada representing the overall viewpoint of the aviation community. CARAC's prime objective is to assess and recommend potential regulatory changes through cooperative rulemaking activities.

UK

Department for Transport: Sustainable Travel
Travel Plan Guides
Using the planning process to secure travel plans- best practice guidance
http://www.dft.gov.uk/stellent/groups/dft_susttravel/documents/page/dft_susttravel_504104.pdf.
A travel plan is a package of measures produced by employers to encourage staff to use alternatives to single-occupancy car use.

- Page 19 – Diagram 1- Travel Plans and the Strategic Planning Process. This flow diagram summarizes the strategic framework and key decisions as to “what’s important” for the local planning authority in respect of travel plans.
- Page 33 – Diagram 3- Mapping the Process flow diagram.

Process improvement within a HR division at a UK police force
International Journal of Operations & Production Management, March 2004, vol. 24, no. 3, pages 230-240(11).
Abstract (courtesy of IngentaConnect):
A structured approach to process improvement is described in the context of the human resources division of a UK police force. The approach combines a number of established techniques of process improvement such as the balanced scorecard and **process mapping** with a scoring system developed to prioritize processes for improvement. The methodology described presents one way of ensuring the correct processes are identified and redesigned at an

operational level in such a way as to support the organization's strategic aims. The case demonstrates the need to choose and in some cases develop in-house tools and techniques dependent on the context of the process improvement effort.

2. Other Process Mapping Approaches for DOTs

California

Inland Central California Collaborative Planning Assessment (ICCCPA)

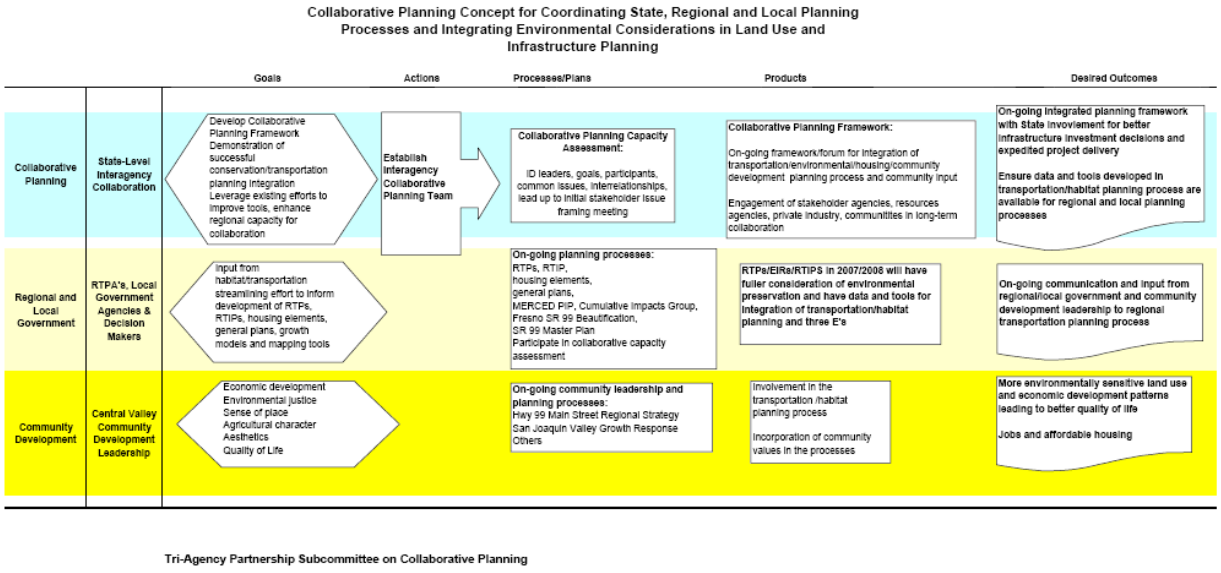
http://www.fresnocog.org/agendas/ttc/05-04-05TTCana_AGD.pdf (scroll to Page 4, Section F).

In 2001, the Secretaries of the Business, Transportation and Housing Agency, the Environmental Protection Agency and the Resources Agency signed a Memorandum of Understanding establishing the Tri-Agency Partnership. The secretaries committed their departments to work collaboratively to promote infrastructure project delivery while protecting and enhancing the environment. The Subcommittee for Collaborative Planning was charged with identifying places around the state where growth pressures, infrastructure needs and environmentally sensitive lands were bound to collide and could benefit from integrated collaborative planning. The subcommittee created the ICCCPA project to explore how collaborative planning efforts could integrate environmental considerations with infrastructure needs early in the planning process to expedite transportation project delivery and housing.

From the Subcommittee:

Collaborative Planning Concept for Coordinating State, Regional and Local Planning Processes and Integrating Environmental Considerations in Land Use and Infrastructure Planning

http://www.dot.ca.gov/hq/tpp/offices/orip/Collaborative%20Planning%20Flow%20Chart.pdf.



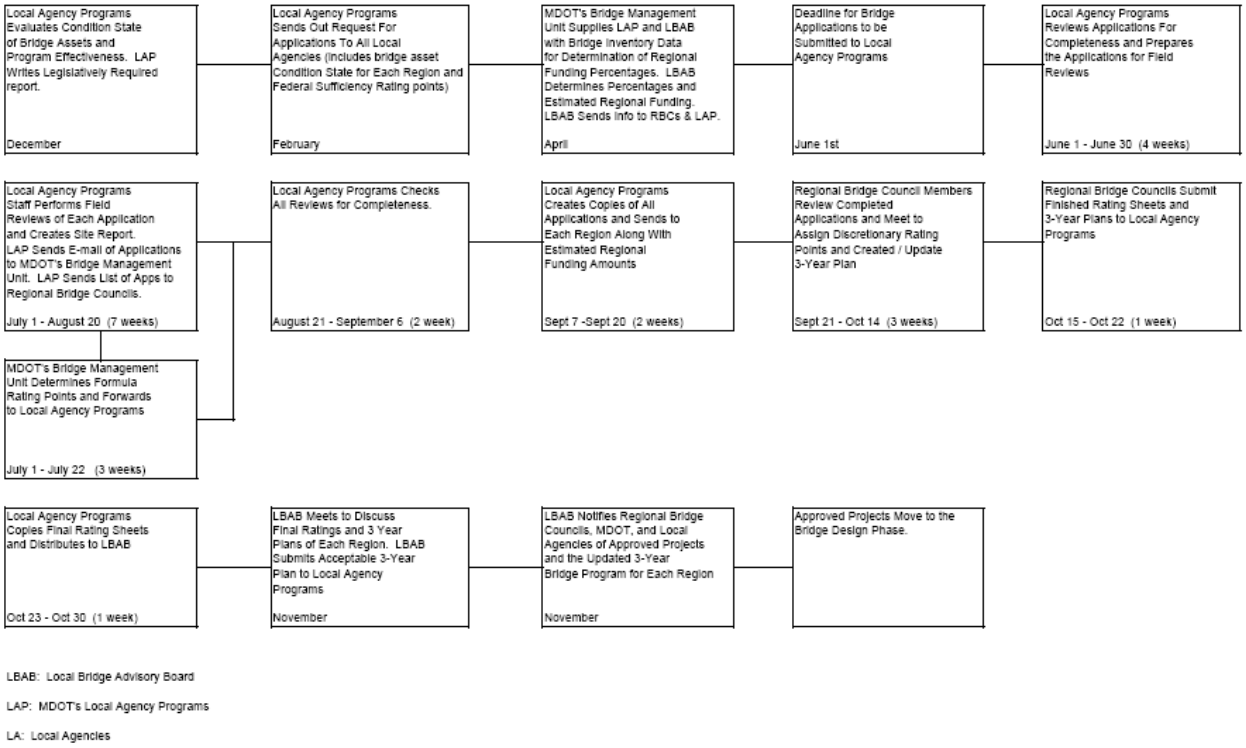
Michigan

Local Bridge Program

http://www.michigan.gov/documents/mdot_Overview_of_Local_Bridge_Program_116617_7.pdf.

The Local Bridge Program is a new program that replaces the Michigan Critical Bridge Program. Legislation enacted Oct. 1, 2004 created a Local Bridge Fund (LBF), a Local Bridge Advisory Board (LBAB) and seven Regional Bridge Councils (RBC). This legislation will place control of the funding allocations of the newly formed LBF and the bridge selection process in the hands of the local agencies of Michigan.

Flow Chart of Local Bridge Process Steps
http://www.michigan.gov/documents/mdot_Flow_Chart_of_Local_Bridge_Process_Steps_116626_7.pdf.



Procedure for Processing Non-Competitive Bid Contracts

http://www.michigan.gov/documents/mdot_noncomp_78498_7.pdf.

The process for a local agency to perform construction work by a non-competitive bid contract follows the federal aid process outlined in Title 23 part 112 and 23 CFR part 635. This document explains the steps in the Non-Competitive Bid Process Flow Chart at http://www.michigan.gov/documents/mdot_flowchart-distill_78544_7.pdf.

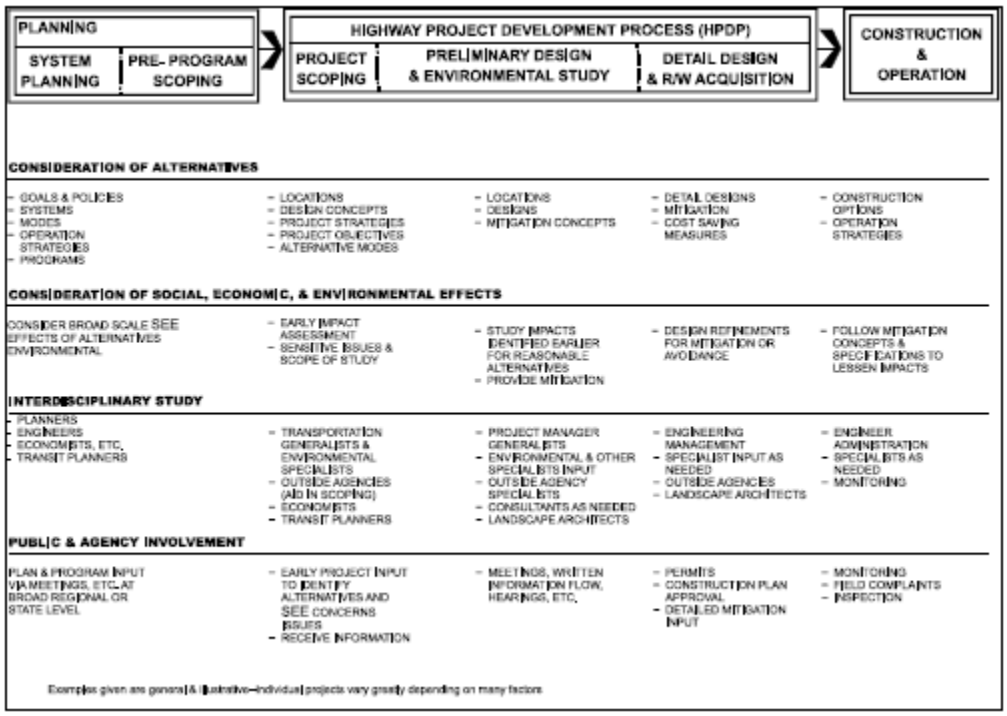
Minnesota

Mn/DOT Highway Project Development Process Handbook

Part I: Overview

http://www.dot.state.mn.us/tecsup/xyz/plu/hpdp/book1/overview/overview.pdf.

Figure 12, Page 28- Process Flow for Major Projects. This diagram depicts the major flows through the process which would be followed on more complex projects. The same thought process would occur on less complex projects, but public and agency involvements and project impacts would be less.



UK

Department for Transport

A cost recovery system for speed and red-light cameras – two year pilot evaluation (Feb 11, 2003)

Appendix C: The Enforcement Process

http://www.dft.gov.uk/stellent/groups/dft_rdsafety/documents/page/dft_rdsafety_507639.pdf (scroll to Page 36).

The Administrative Process- Key elements of the enforcement process are discussed. A flow diagram depicts the administrative process associated with camera enforcement: